Metagenomics and biogeochemistry of shallow submarine vent field, Spathi Bay, Milos Island, Greece

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Shallow submarine hydrothermal ecosystems, located at depth <200m, are extreme environments influenced by both geothermal activity and light. They are described as “high energy environments” fuelling various microbial processes. However, little is known about sediment geochemistry, microbial diversity, or how these components interact and influence *in situ* biogeochemical cycles. The shallow submarine hydrothermal system of Spathi Bay (southeast coast of Milos Island, Greece) exhibits visual and exhibits characteristic zonation of white- and brown-coloured surface deposits surrounding the vent area, located at a depth of 12.5 m. Here, the question of the putative role of sediment composition, chemistry on the microbial spatial distribution and also the role of all of them on ocean chemistry is still open. We analysed, water column, sediment pore water, sediment composition and the associated metagenome of white, brown and reference sediments to unravel processes involved in the cycling of As, P, Fe, S and C. Deep sequencing coverage provides high-resolution information on the bacterial and archaeal diversity and distribution according to sediment depth. Coupled to chemical and mineralogical characterization, we highlight potential interactions between microbial communities, sediment and ocean chemistry.